

## PATENT COOPERATION TREATY

## PCT

## INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference <b>16219-PCT</b>	<b>FOR FURTHER ACTION</b> see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No. <b>PCT/US 00/ 29211</b>	International filing date (day/month/year) <b>23/10/2000</b>	(Earliest) Priority Date (day/month/year) <b>22/10/1999</b>
Applicant <b>THE GOVERNMENT OF THE UNITED STATES AS REPRESENTED BY THE SECRETARY OF COMMERCE</b>		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 4 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

## 1. Basis of the report

- a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

- b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing:

☐ contained in the international application in written form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

2. ☐ **Certain claims were found unsearchable** (See Box I).

3. ☐ **Unity of invention is lacking** (see Box II).

4. With regard to the **title**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

☐ the text is approved as submitted by the applicant.

☒ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No.

☐ as suggested by the applicant.

☐ because the applicant failed to suggest a figure.

☒ because this figure better characterizes the invention.

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☐ None of the figures.

**Box III TEXT OF THE ABSTRACT (Continuation of Item 5 of the first sheet)**

A membrane structure includes at least one electroactive bending actuator (150,160) fixed to a supporting base (120). Each electroactive bending actuator (160) is operatively connected to the membrane (110) for controlling the membrane position. Any displacement of each electroactive bending actuator effects displacement of the membrane. More specifically, the operative connection is provided by a guiding wheel assembly (200) and a track (210), wherein displacement of the bending actuator effects translation of the wheel assembly along the track, thereby imparting movement to the membrane.

**A. CLASSIFICATION OF SUBJECT MATTER**  
 IPC 7 H01L41/09

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 H01L H01Q

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

INSPEC, COMPENDEX, EPO-Internal, WPI Data, PAJ

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5 440 320 A (LACH OLIVIER ET AL) 8 August 1995 (1995-08-08) column 2, line 25 -column 6, line 7; figures 4,5	1
A	US 5 162 811 A (LAMMERS UVE H W ET AL) 10 November 1992 (1992-11-10) column 2, line 52 -column 5, line 26; figures 2,3	1
A	UTKU S ET AL: "Shape control of inflatable reflectors" JOURNAL OF INTELLIGENT MATERIAL SYSTEMS AND STRUCTURES, vol. 6, no. 4, July 1995 (1995-07), pages 550-556, XP000991585 ISSN: 1045-389X the whole document	1

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

\* Special categories of cited documents:

\*A\* document defining the general state of the art which is not considered to be of particular relevance

\*E\* earlier document but published on or after the international filing date

\*L\* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

\*O\* document referring to an oral disclosure, use, exhibition or other means

\*P\* document published prior to the international filing date but later than the priority date claimed

\*T\* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

\*X\* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

\*Y\* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

\*Z\* document member of the same patent family

Date of the actual completion of the international search

15 March 2001

Date of mailing of the international search report

22/03/2001

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## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	PELRINE R E ET AL: "Electrostriction of polymer dielectrics with compliant electrodes as a means of actuation" SENSORS AND ACTUATORS A, vol. 64, no. 1, 1998, pages 77-85, XP004102141 ISSN: 0924-4247 abstract page 83, paragraph 3 -page 84, paragraph 2 -----	1-4

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 5440320	A	08-08-1995	FR 2678111 A CA 2070793 A EP 0519775 A JP 5191134 A	24-12-1992 20-12-1992 23-12-1992 30-07-1993
US 5162811	A	10-11-1992	NONE	